

# PadhAI: 6 Jars of Sigmoid Neuron

## One Fourth Labs

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### Sigmoid Loss Function

What is the loss function used for this model

1. Here the squared-error function is used **loss** =  $\sum_i (y_i - \hat{y}_i)^2$ . Another useful loss function is called the cross entropy function.
2. Consider the following data

$x_1$	$x_2$	$y$	$\hat{y}$
1	1	0.5	0.6
2	1	0.8	0.7
1	2	0.2	0.2
2	2	0.9	0.5

3. Loss =  $\sum_i (y_i - \hat{y}_i)^2 = 0.18$
4. This also works if  $y$  is boolean valued

$x_1$	$x_2$	$y$	$\hat{y}$
1	1	1	0.6
2	1	1	0.7
1	2	0	0.2
2	2	0	0.5

5. Loss =  $(1 - 0.6)^2 + (1 - 0.7)^2 + (0 - 0.2)^2 + (0 - 0.5)^2$
6. The interesting thing to note here is that in sigmoid neuron, each individual points contribute differently to the overall loss. Some points are more correct than others and some are more wrong than others.
7. Whereas in Perceptron, it was either right or wrong, no degrees of correctness or wrongness.